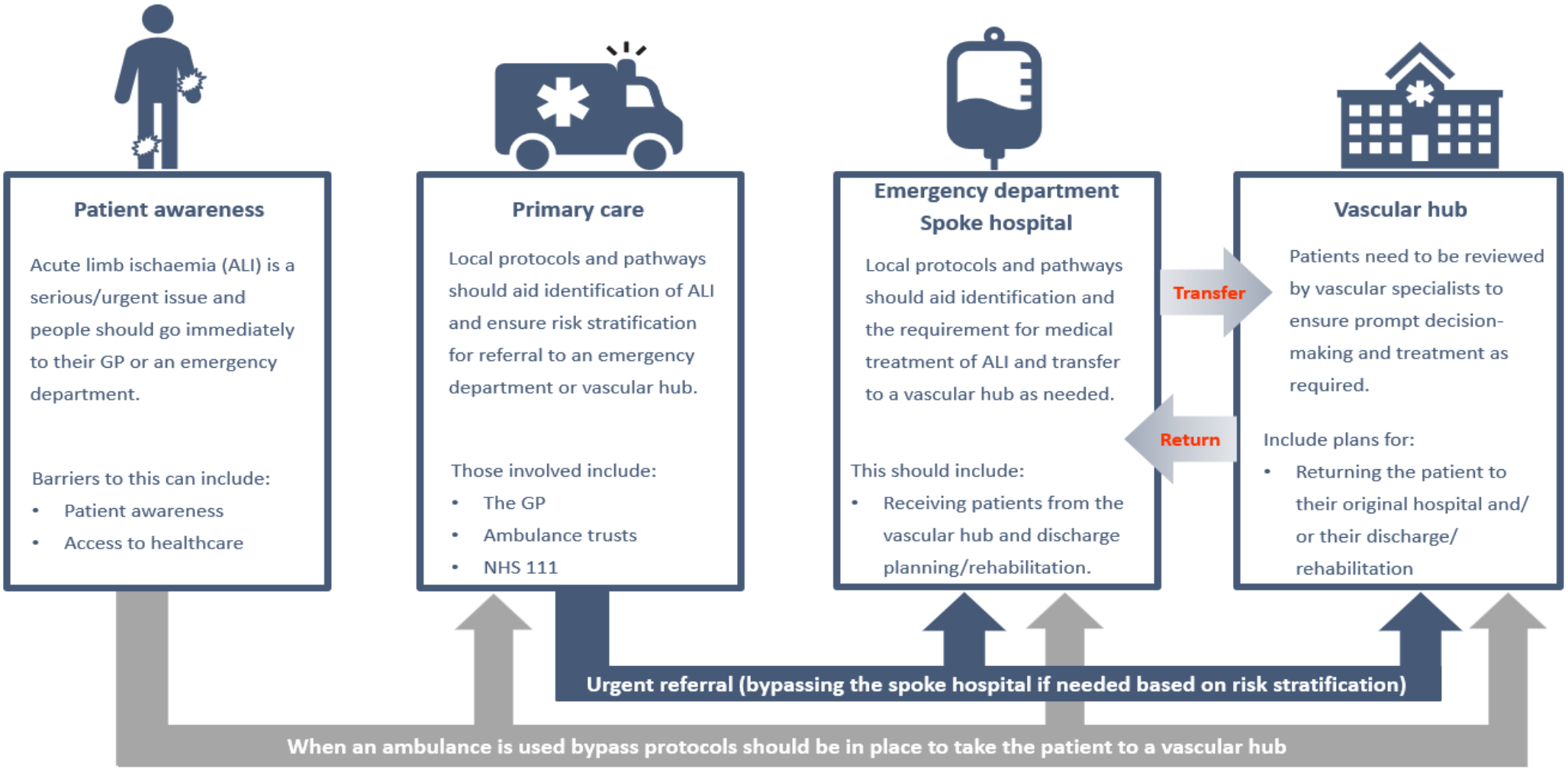
Patient awareness
Acute limb ischaemia (ALI) is a serious/urgent issue and people should go immediately to their GP or an emergency department.
Barriers to this can include:
• Patient awareness
• Access to healthcare
Primary care
Local protocols and pathways should aid identification of ALI and ensure risk stratification for referral to an emergency department or vascular hub.
Those involved include:
• The GP
• Ambulance trusts
• NHS 111
Emergency department Spoke hospital
Local protocols and pathways should aid identification and the requirement for medical treatment of ALI and transfer to a vascular hub as needed.
This should include:
• Receiving patients from the vascular hub and discharge planning/rehabilitation.
Transfer
Return
Vascular hub
Patients need to be reviewed by vascular specialists to ensure prompt decision-making and treatment as required.
Include plans for:
• Returning the patient to their original hospital and/ or their discharge/ rehabilitation
Urgent referral (bypassing the spoke hospital if needed based on risk stratification)
When an ambulance is used bypass protocols should be in place to take the patient to a vascular hub

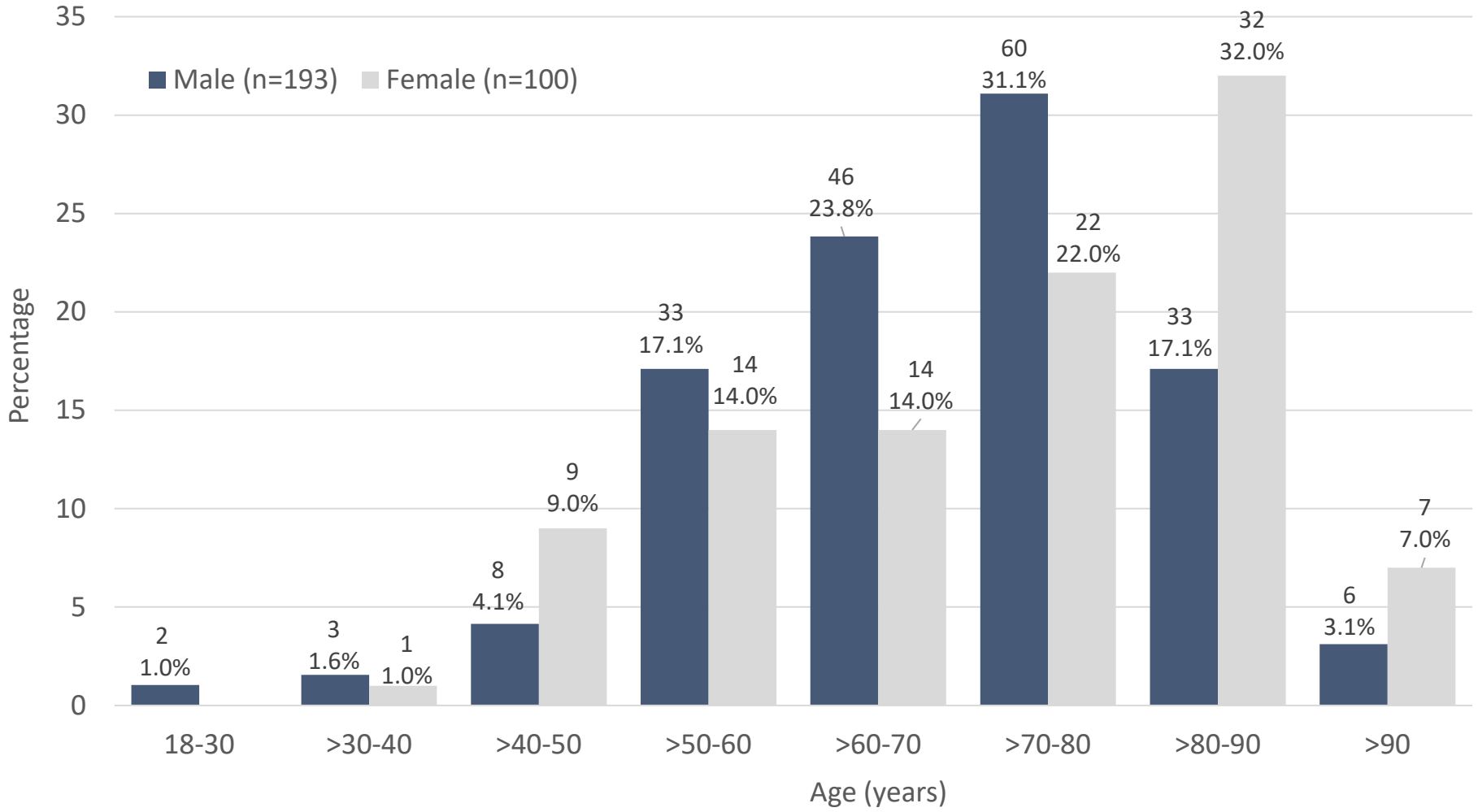

Figure 2.1 Age and sex of the study population; *n=293, mean=71, median=72, mode=86*

Clinician questionnaire data

Table 2.1 Ethnicity of the study population	Number of patients	%	National Census Data 2021
White British/White - other	260	97.0	81.7
Asian/Asian British (Indian, Pakistani, Bangladeshi, Chinese, other Asian)	4	1.5	9.3
Black/African/Caribbean/Black British	2	<1	4.0
Other ethnic group	2	<1	2.1
Mixed or multiple ethnic groups	0	0	2.9
Subtotal	**268**		
Unknown	25		
Total	**293**		

Clinician questionnaire data

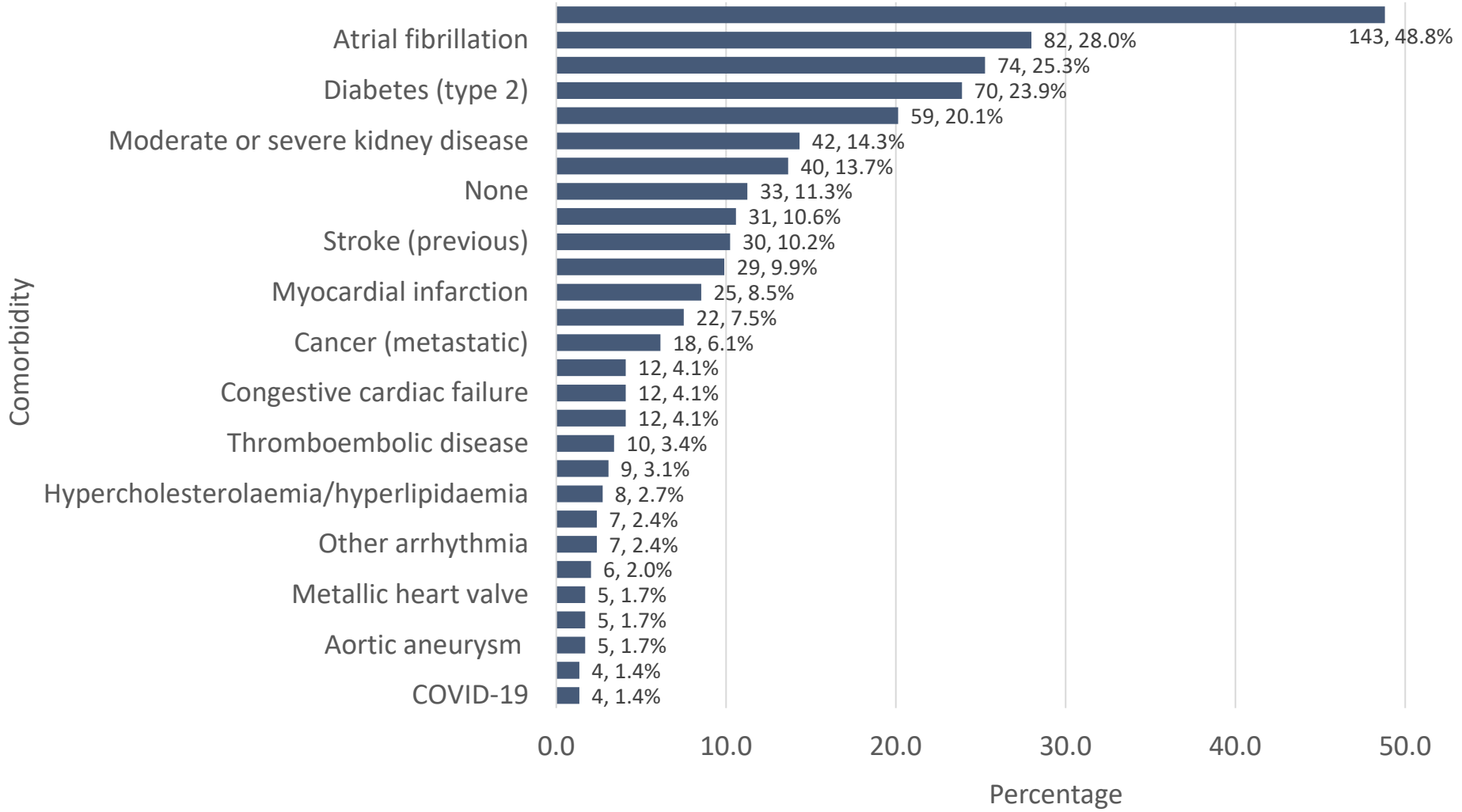

Figure 2.2 Comorbidities in the study population. *Answers may be multiple*; *n=293*

Clinician questionnaire data

Table 2.2 Medications on admission	Number of patients	%
Anti-hypertensives	128	45.4
Lipid-lowering drugs	117	41.5
Single anti-platelet	90	31.9
None	56	19.9
Direct oral anticoagulants (DOAC)	44	15.6
Dual anti-platelet	16	5.7
Warfarin	16	5.7
Other anticoagulants	14	5.0
Hormone treatment	2	<1%

Answers may be multiple; n=282, unknown in 11

Clinician questionnaire data

Table 2.3 Smoking status of the study population	Number of patients	%
Current smoker	117	44.2
Ex-smoker	94	35.5
Never smoked	54	20.4
Subtotal	**265**	
Unknown/vaper	28	
Total	**293**	

Clinician questionnaire data

Table 2.4 Usual place of residence	Number of patients	%
Own home	261	92.6
Residential home	12	4.3
Nursing home	5	1.8
Other/homeless	4	1.4
Subtotal	**282**	
Unknown	11	
Total	**293**	

Clinician questionnaire data

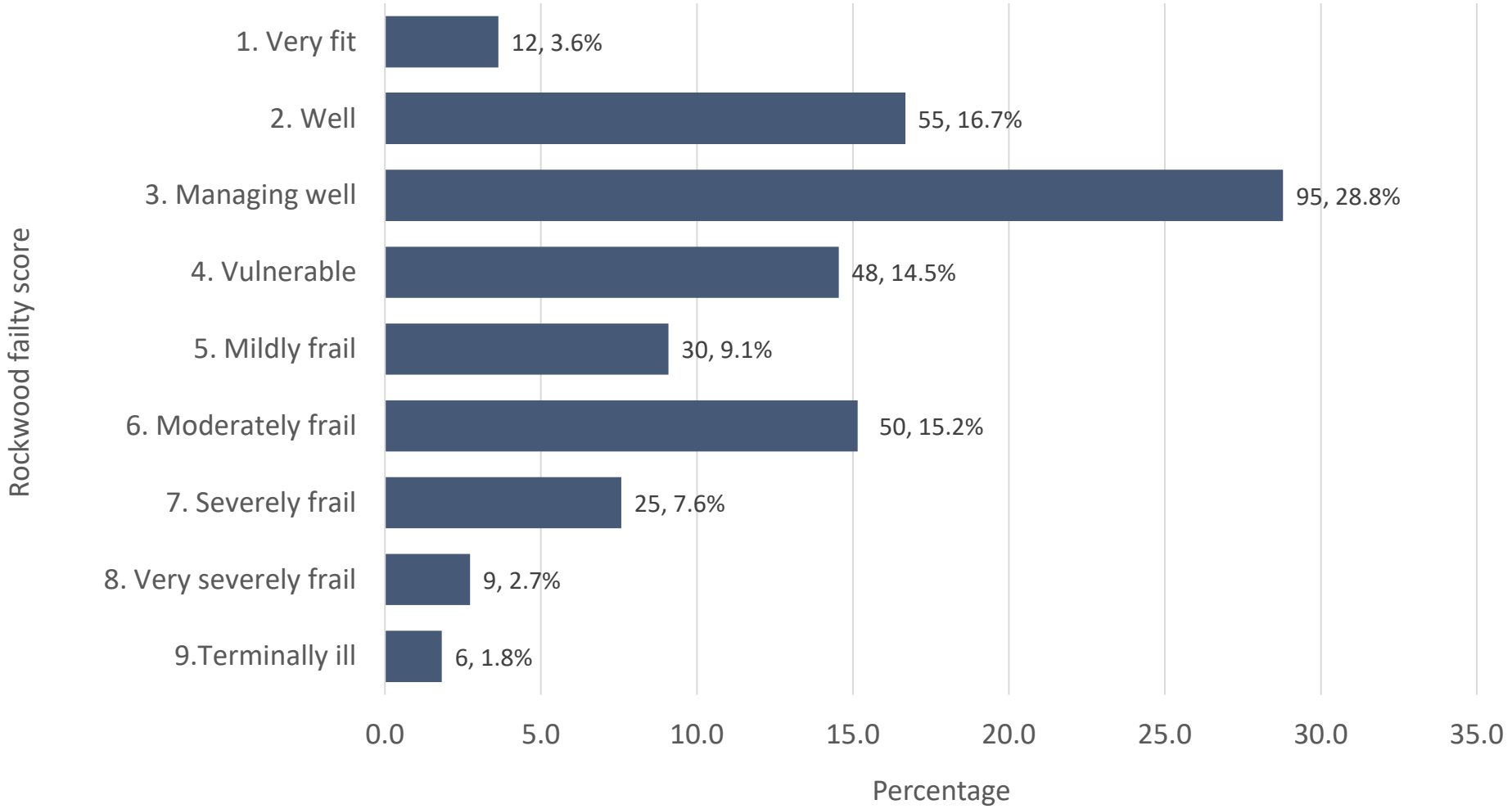

Figure 2.3 Estimated Rockwood frailty score prior to admission; *n=330*

Case review data

Table 2.5 The patient had communication difficulties	Number of patients
Language	10
Hearing difficulties	8
Dementia	5
Learning difficulties/disability	5
Dysphasia/cognitive impairment post-stroke	4

Answers may be multiple; n=34

Case review data

Table 2.6 The presenting limb	Number of patients	%
Lower limb	303	91.8
Upper limb	28	8.5

Answers may be multiple; n=330

Case review data

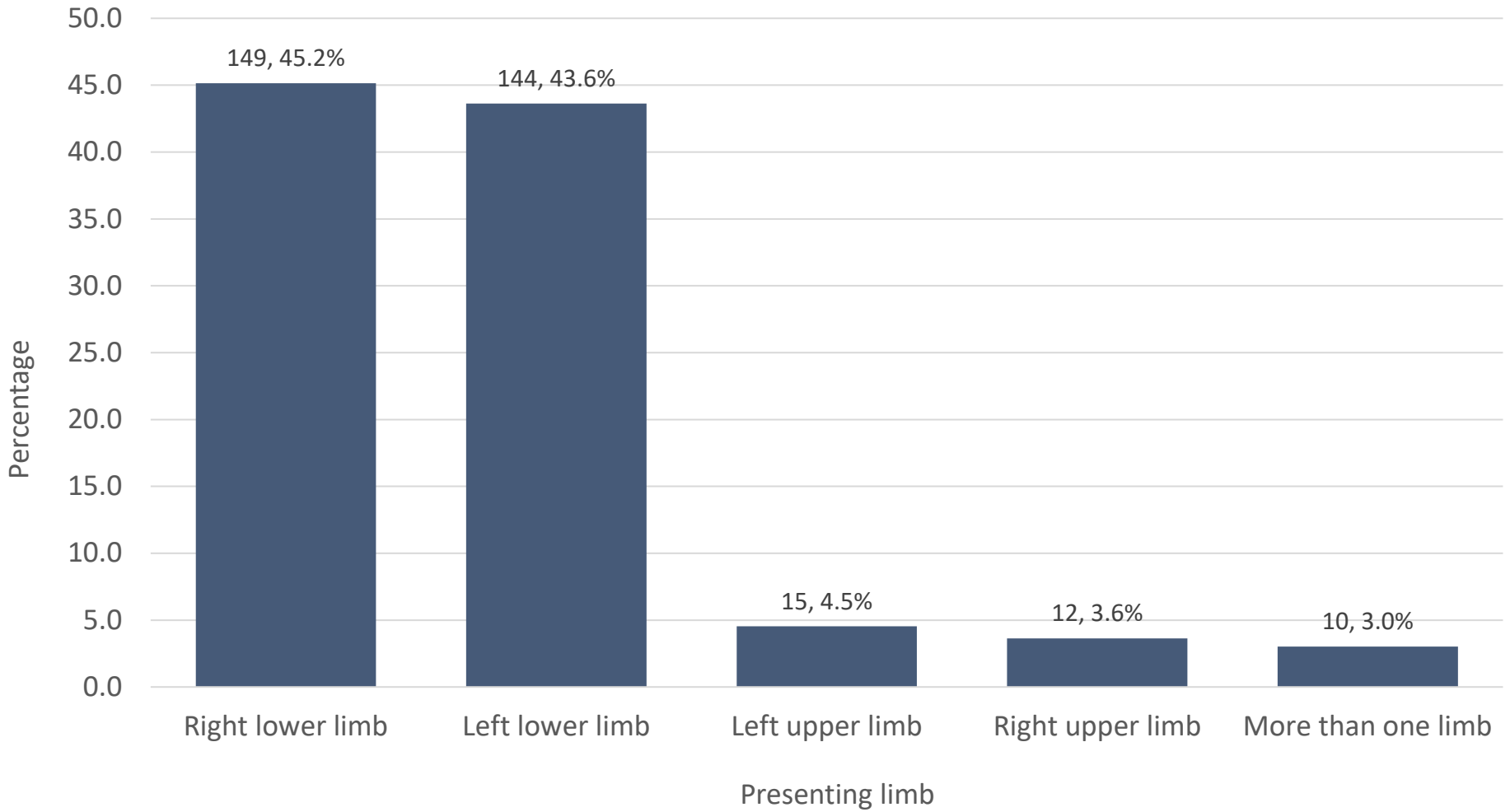

Figure 2.4 Presenting limb; *n=330*

Case review data

Table 2.7 Prior condition of the presenting limb	Number of patients	%
Asymptomatic	178	60.8
Intermittent claudication	63	21.5
Rest pain	46	15.7
Tissue loss/gangrene/ulceration	11	3.8
Nothing recorded	5	1.7
Discolouration	3	1.0
Other	3	1.0

Answers may be multiple; n=293

Clinician questionnaire data

Table 3.1 The European Society for Vascular Surgery (ESVS) modification of the categories of ALI according to Rutherford's clinical findings				
Grade	**Category**	**Sensory loss**	**Motor deficit**	**Prognosis**
I	Viable	None	None	No immediate threat
IIa	Marginally threatened	None or minimal (toes)	None	Salvageable if promptly treated
IIb	Immediately threatened	More than toes	Mild/ moderate	Salvageable if promptly revascularised
III	Irreversible	Profound, anaesthetic	Profound, paralysis	Major tissue loss amputation. Permanent nerve damage inevitable

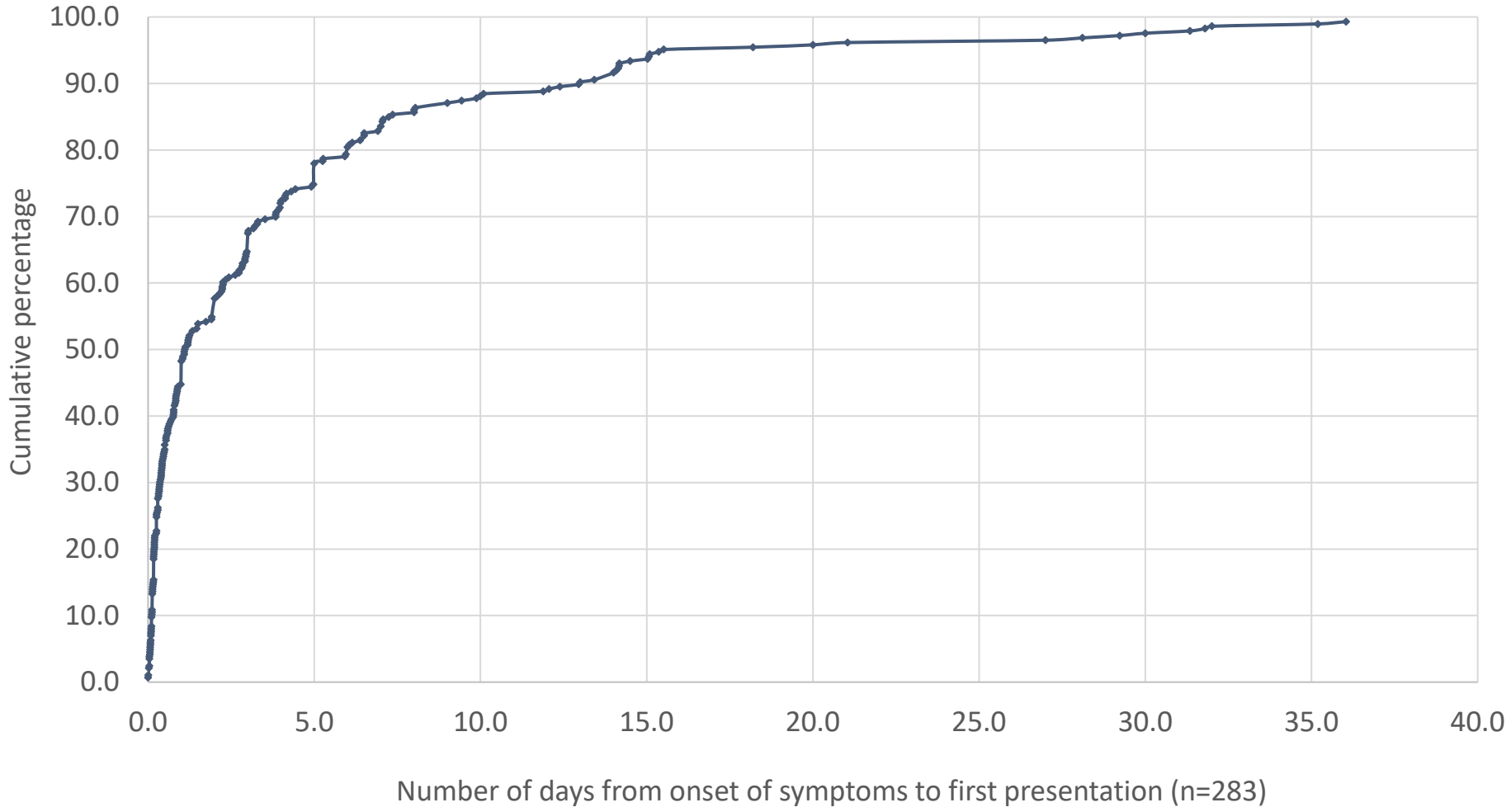

Figure 4.1 Time from onset of symptoms to first presentation to healthcare*; n=283*

Case review data

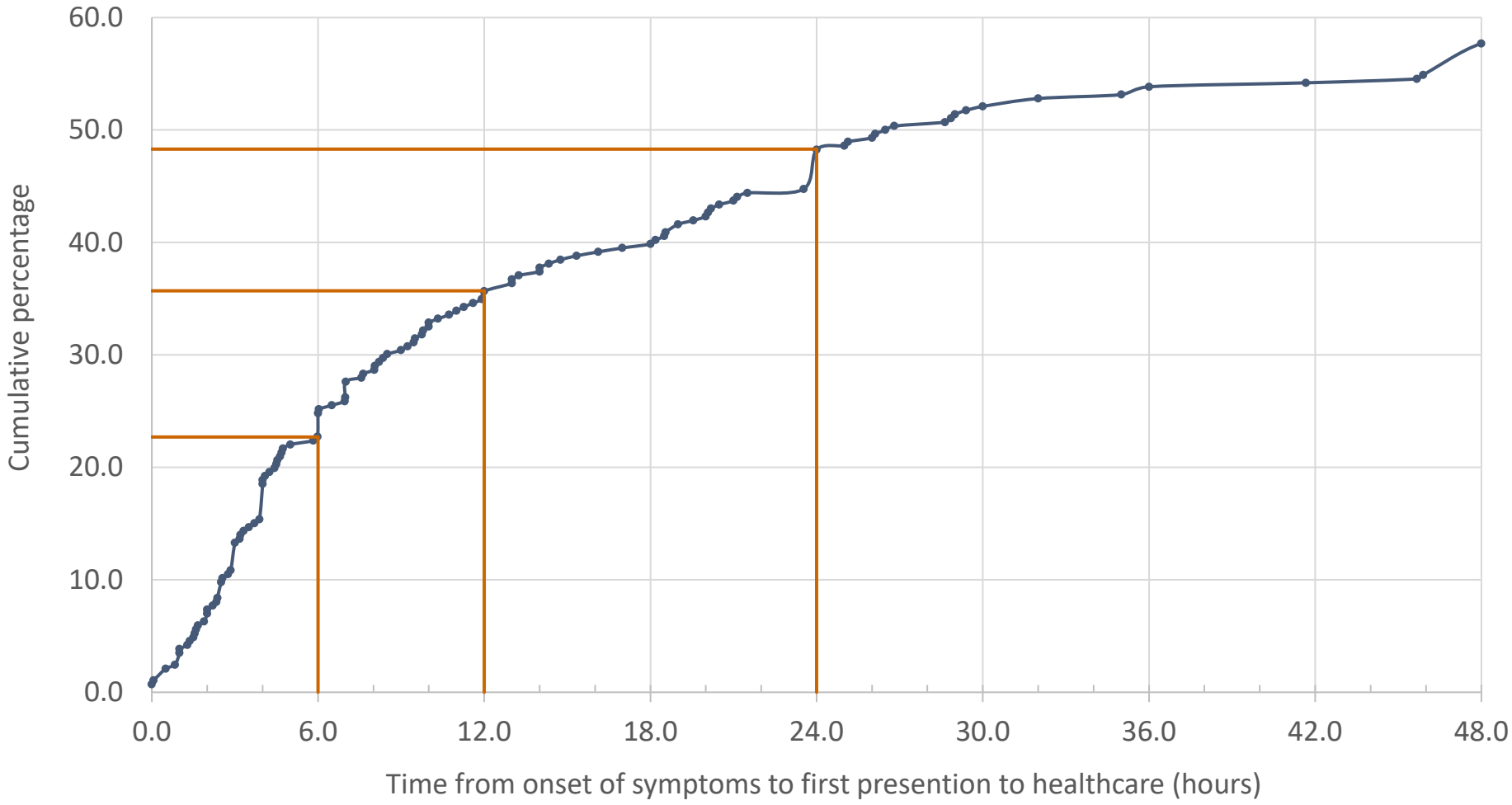

Figure 4.2 Time from onset of symptoms to first presentation to healthcare in hours; *n=283*

Case review data

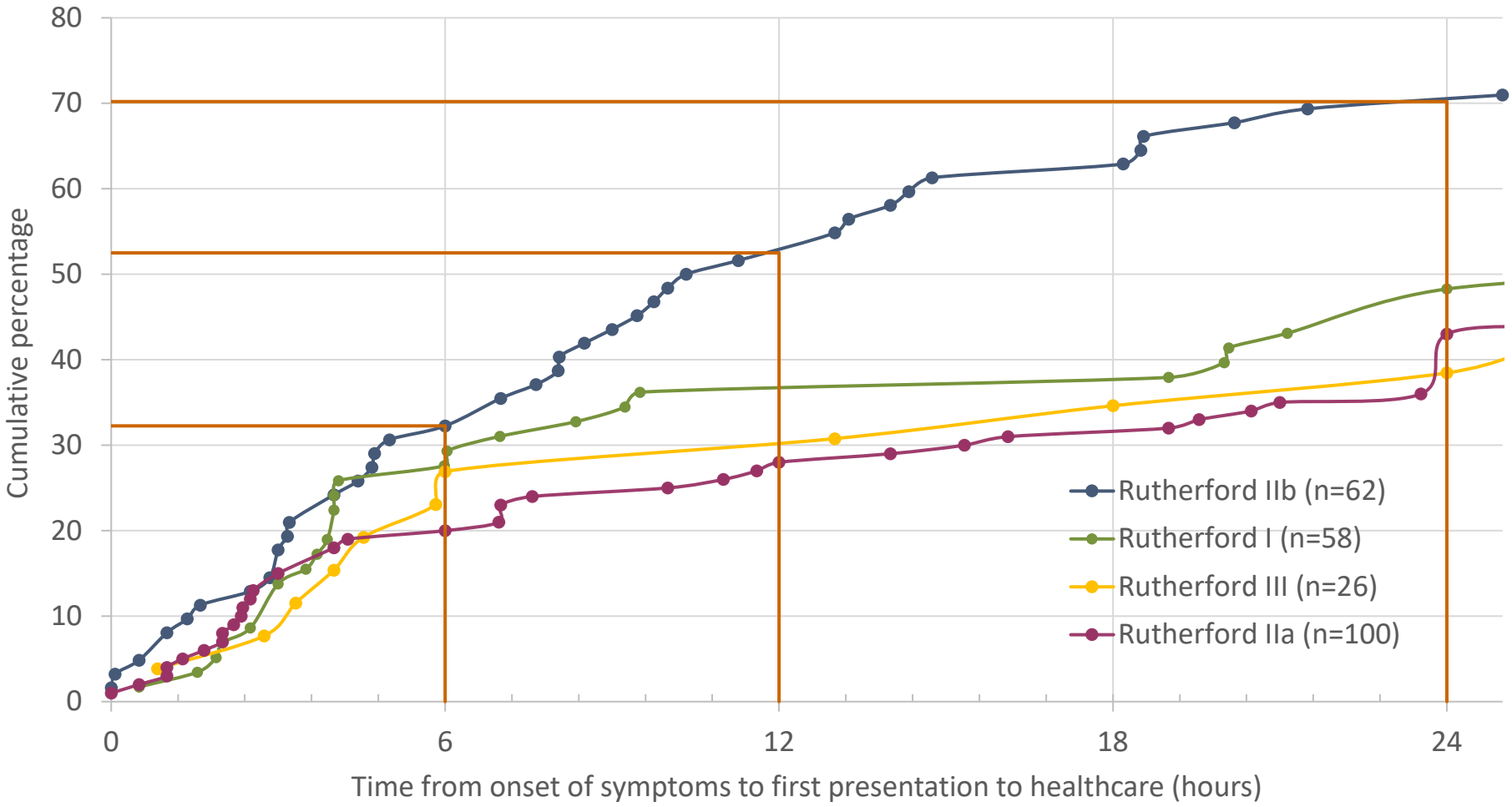

Figure 4.3 Time from onset of symptoms to first presentation to healthcare split by Rutherford category

Case review data

Table 4.1 Healthcare provider that the patient first presented to	Number of patients	%
Self-presented to a vascular hub emergency department	83	25.5
Self-presented to a spoke hospital emergency department	79	24.3
999 call	69	21.2
Primary care	68	20.9
Presented at an outpatient clinic	14	4.3
NHS 111	12	3.7
Subtotal	**325**	
Unknown	5	
Total	**330**	

Case review data

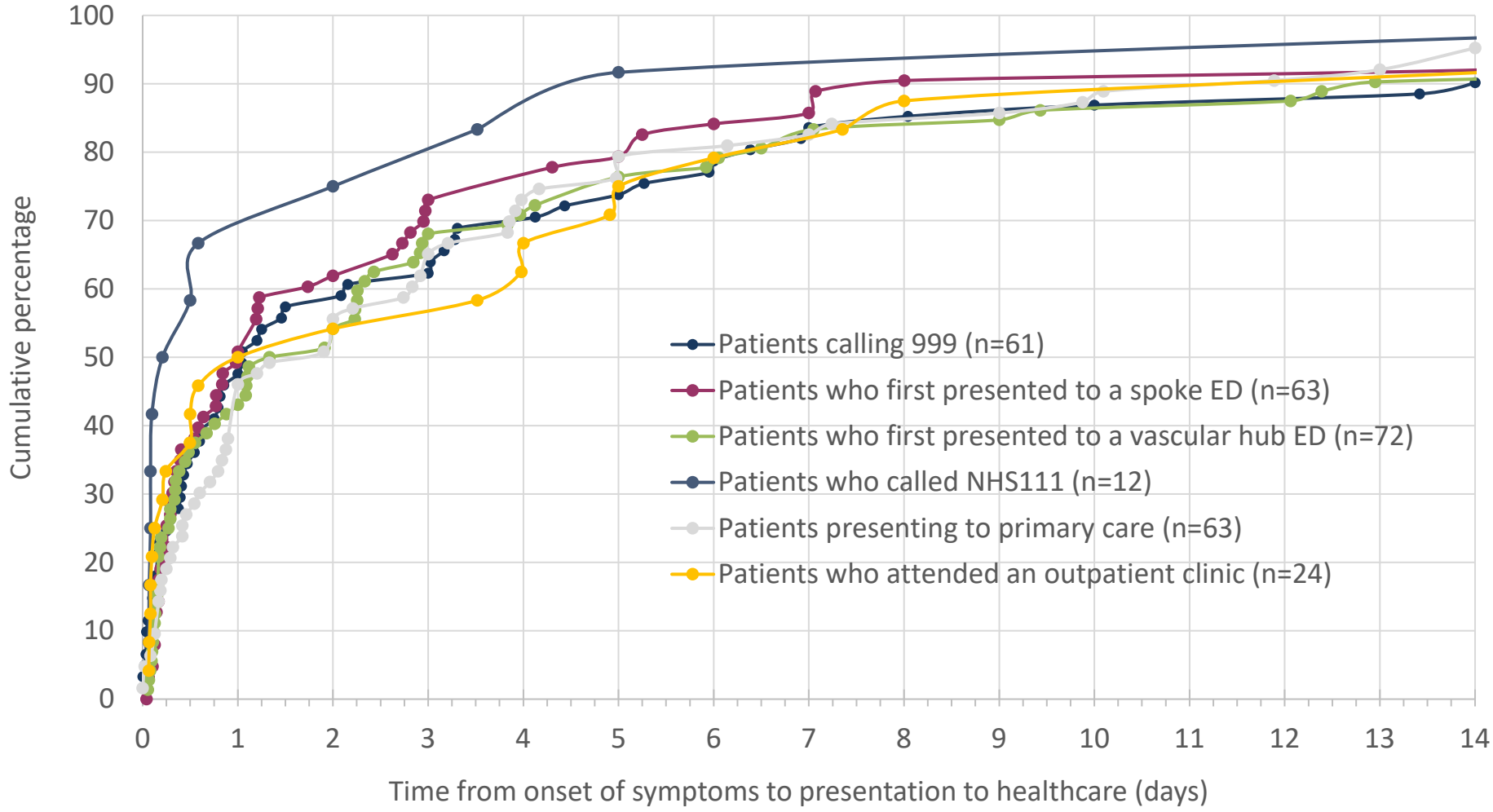

Figure 4.4 Time from onset of symptoms to first presentation to healthcare split by where the patient first presented

Case review data

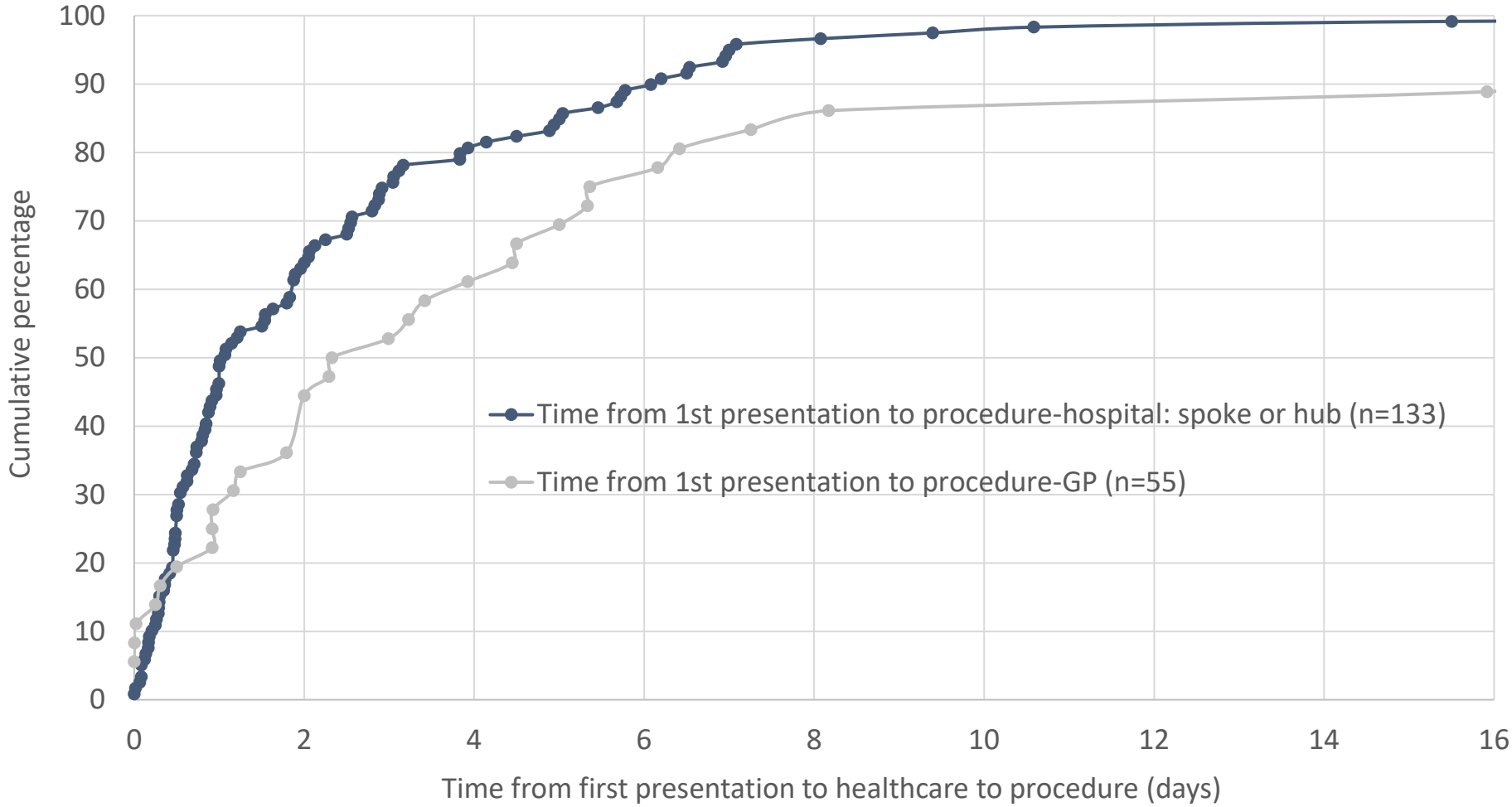

Figure 5.1 Time from first presentation to healthcare to time of first procedure

Case review data

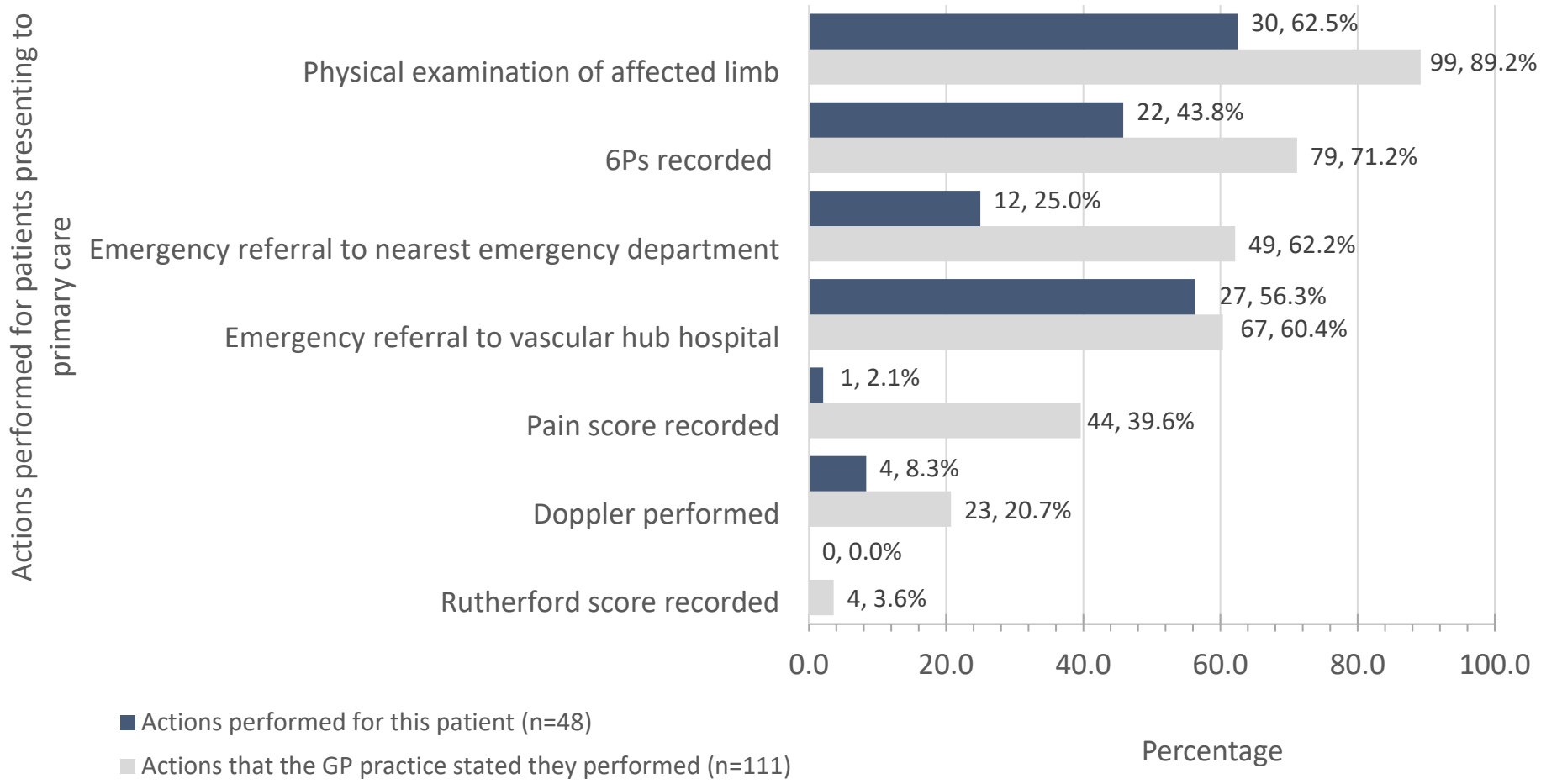

Figure 5.2 Primary care: assessment, diagnosis and actions. Actions that this GP practice stated they performed for patients with ALI; *n=111*, patients with ALI seen at this GP practice; *n=48*

Primary care questionnaire data

Table 5.1 Signs of ALI at presentation to primary care	Number of patients	%
Pain	42	87.5
Pallor	17	35.4
Pulseless limb	15	31.3
Perishingly cold (poikilothermia)	15	31.3
Paraesthesia	10	20.8
Swollen limb	6	12.5
Paralysis	3	6.3
Unknown	2	4.2

Answers may be multiple; n=48

Primary care questionnaire

Table 6.1 Reasons for the delay in the patient presenting to a hospital	Number of patients
Patient delayed seeking help	22
Patient sought help from primary/ambulatory care was misdiagnosed and discharged home	5
Patient presented to primary care - referred to spoke hospital	5

Answers may be multiple; n=31

Clinician questionnaire data

Table 6.2 Rutherford category in the spoke hospital (combination of recorded in notes and estimated by reviewers)	Number of patients	%
Rutherford I	13	12.3
Rutherford IIa	55	51.9
Rutherford IIb	30	28.3
Rutherford III	8	7.5
Subtotal	**106**	
Unable to calculate	32	
Total	**138**	

Case review data

Table 7.1 Details of the delay in the transfer to a vascular hub	Number of patients
Waiting for an ambulance for the transfer	11
Decision-making in the spoke hospital	9
Referral/acceptance at the vascular hub	7
Distance needed to travel to the vascular hub	2
Unclear	4

Answers may be multiple; n=34

Case review data

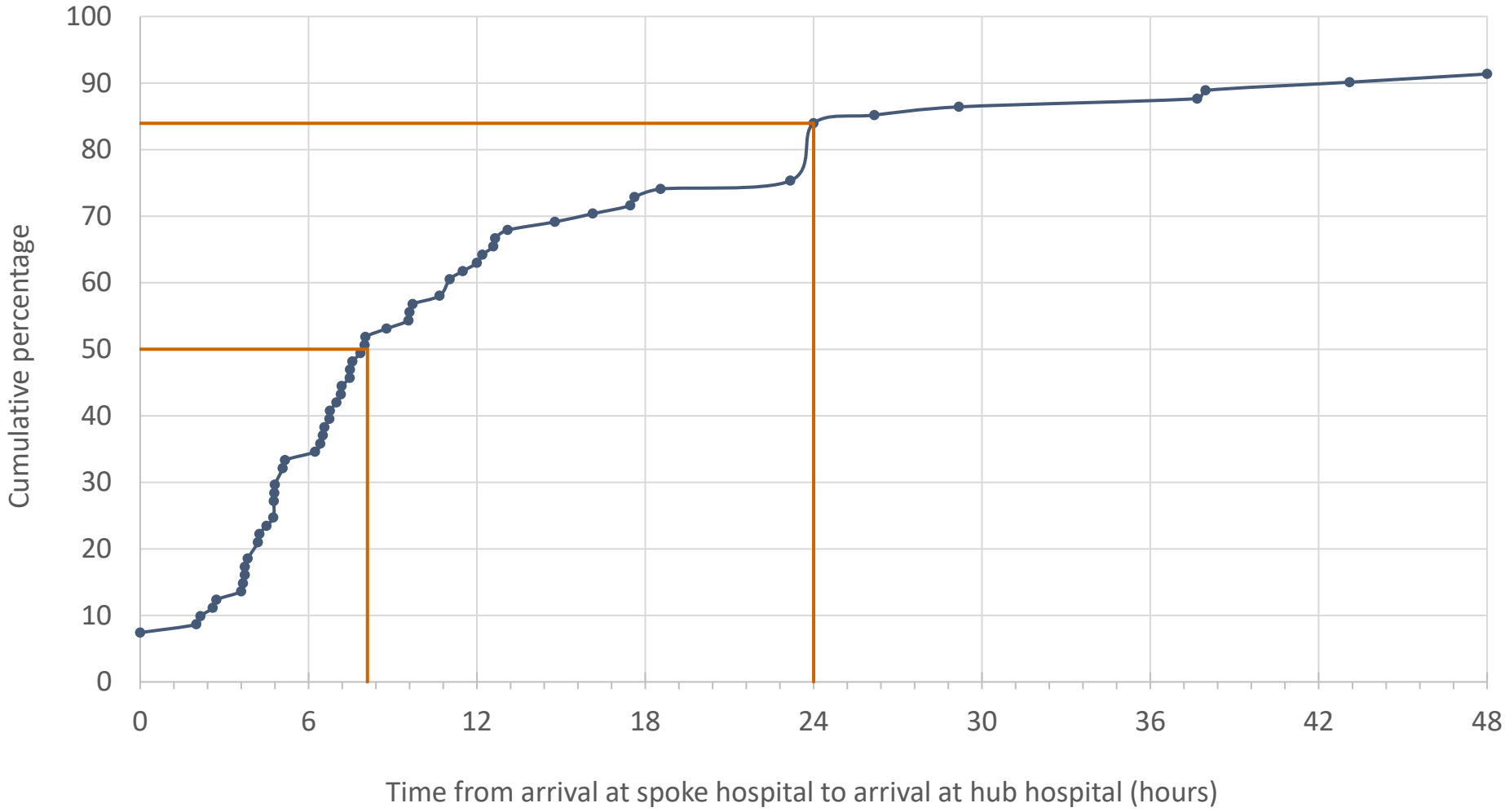

Figure 7.1 Time from presentation to spoke hospital to arrival in vascular hub; *n=81*

Case review data

Table 7.2 Details of ALI guidance in spoke hospitals	Number of hospitals
A protocol covering the process of referring the patient to the vascular hub	40
Referrals to the vascular hub via a defined vascular surgical single point of contact	38
A protocol for the assessment and recognition of ALI	31
Category/urgency of ambulance transfer	25
Preferred imaging modalities for patients with symptoms of ALI	24
A transfer protocol covering the patient transfer to the vascular hub	24
A protocol covering medical treatment of patients who are not transferred	13
Recommended timeframes for the completion of required steps on the pathway	9
A protocol covering the discharge of repatriated patients ensuring all necessary onward referrals and follow-up appointments are made	9
Inclusion of a 'Rutherford' or other severity scale	8
A protocol/standard operating procedure covering the process of repatriating the patient to the spoke hospital following treatment at the vascular hub	8

Answers may be multiple; n=56

Spoke hospital organisational data

Table 7.3 Record sharing in vascular networks for patients treated for ALI	Number of spoke hospitals
The spoke hospital and the vascular hub are on the same electronic imaging archiving system, which allows immediate sharing of image reporting	56
The patient case notes sent to the vascular hub are primarily on paper and travel with the patient	42
The spoke hospital and the vascular hub are on the same electronic patient record system, allowing immediate sharing of written case notes	34
Patient case notes are normally emailed to the vascular hub	6

Answers may be multiple; n=91

Spoke hospital organisational data

Table 8.1 Mode of presentation to the vascular hub	Number of patients	%
Transfer from a spoke hospital	138	41.8
Emergency department (within the vascular hub)	82	24.8
Ambulance attendance, blue light to the emergency department	34	10.3
Referral from a GP/primary care transfer	30	9.1
Referral from another inpatient unit	17	5.2
Other ambulance attendance	10	3.0
Referral from another clinic	9	2.7
Referral from a vascular surgery clinic	8	2.4
Referral from NHS 111	2	<1
Total	**330**	

Case review data

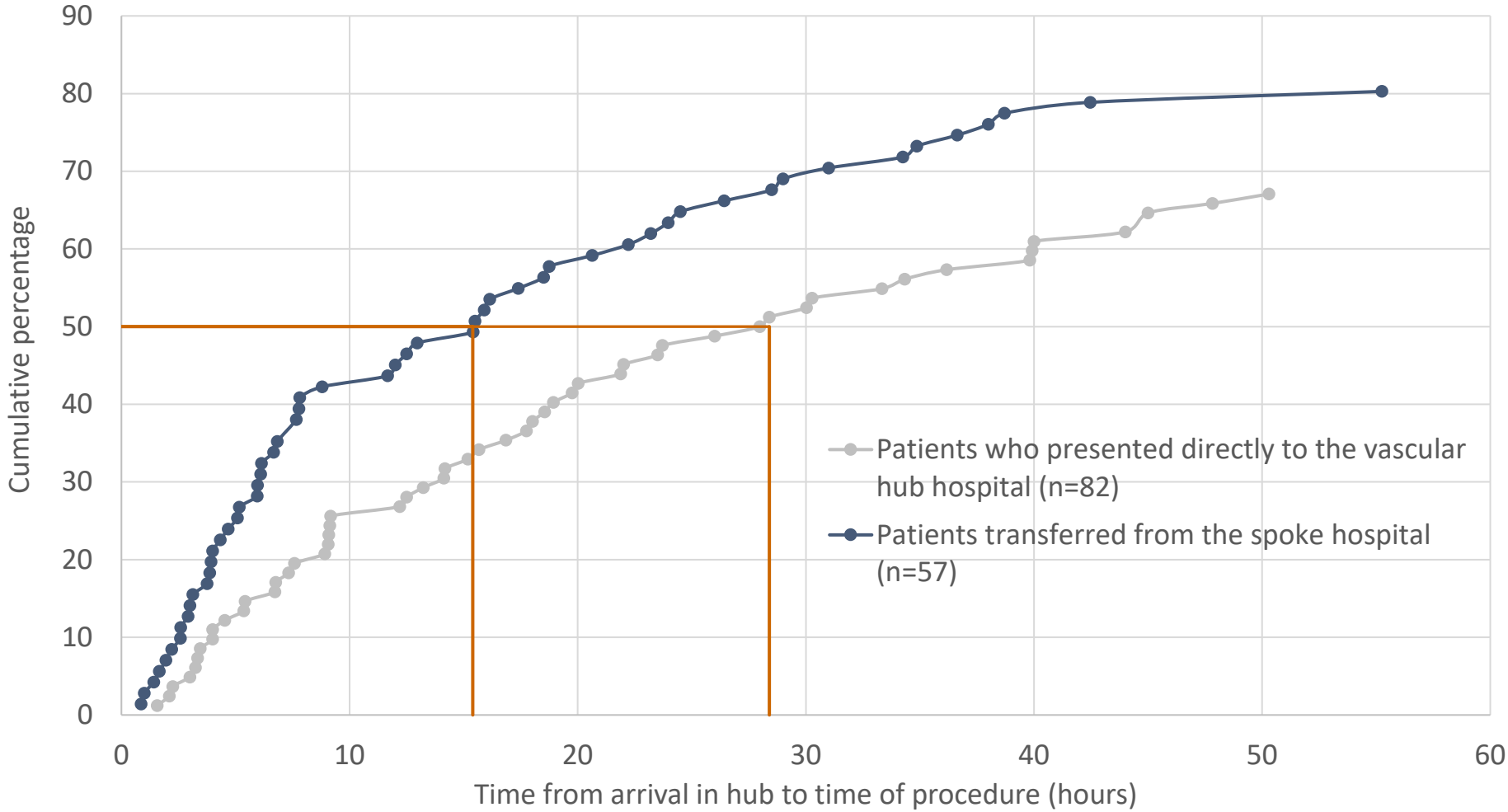

Figure 8.1 Time from arrival in vascular hub to time of procedure- patients admitted directly to vascular hub and those transferred from spoke hospital

Case review data

Table 8.2 Symptoms recorded in the vascular hub	Number of patients	%
Limb pulses	276	94.2
Pain	253	86.3
Cold limb	204	69.6
Paraesthesia	177	60.4
Pallor	146	49.8
Paralysis/weakness	110	37.5
Swollen limb	27	9.2

Answers may be multiple; n=293

Clinician questionnaire data

Table 8.3 Rutherford category	Recorded on admission in the vascular hub notes	Estimated by reviewers	Combination of recorded/estimated
Rutherford I	16 (23.2%)	52 (22.4%)	68 (22.6%)
Rutherford IIa	24 (34.8%)	100 (43.1%)	124 (41.2%)
Rutherford IIb	21 (30.4%)	56 (24.1%)	64 (27.0%)
Rutherford III	8 (11.6%)	24 (10.3%)	32 (10.6%)
Subtotal	**69**	**232**	**301**
Unable to calculate	261	98	29
Total	**330**	**330**	**330**

Case review data

Table 8.4 The Rutherford category changed between the spoke hospital and the vascular hub	Number of patients	%
Stayed the same	81	77.1
Deteriorated	15	14.3
Improved	9	8.6
Subtotal	**105**	
Unknown	33	
Total	**138**	

Case review data

Table 8.5 Detail of the deterioration in Rutherford category	Number of patients
Rutherford I to Rutherford IIb	4
Rutherford IIa to Rutherford IIb	8
Rutherford IIb to Rutherford III	3
Total	**15**

Case review data

Table 8.6 Delay in the diagnosis of ALI in the vascular hub	Number of patients	%
Yes	25	8.4
No	272	91.6
Subtotal	**297**	
Unknown	9	
N/A - diagnosis already made in spoke hospital	24	
Total	**330**	

Case review data

Table 8.7 Reasons for the delayed diagnosis in the vascular hub	Number of patients
Misdiagnosed as deep vein thrombosis	6
Misdiagnosed as chronic limb threatening ischaemia	6
Diagnosis missed	3
Delay in imaging	3
Referred to the stroke team	2
No details provided	5
Total	**25**

Case review data

Table 8.8 Reasons for delay in treatment planning	Number of patients
Awaiting imaging	11
Awaiting multidisciplinary input	8
Reviewers unable to determine a reason from the records	8
Awaiting senior surgical review	6
Awaiting anticoagulation	1
Total	**34**

Case review data

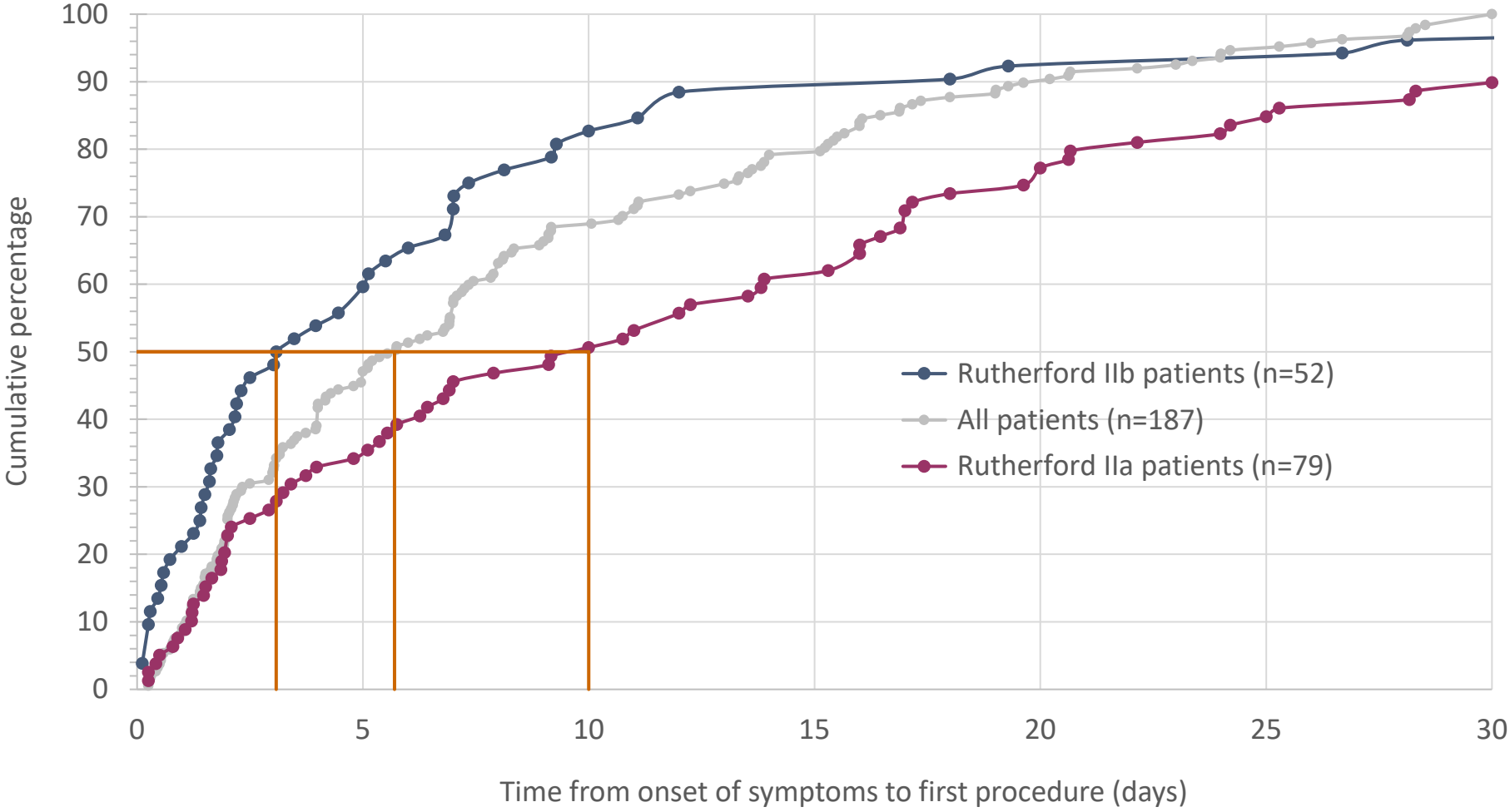

Figure 9.1 Time from onset of symptoms to procedure

Case review data

Table 9.1 First procedure performed	Number of patients	%
Surgical revascularisation procedure	159	63.9
Amputation	35	14.1
Fasciotomy	34	13.6
Endovascular revascularisation procedure	28	11.2
Hybrid revascularisation procedure/surgical and endovascular	22	8.8

Answers may be multiple; *n=249*

Case review data

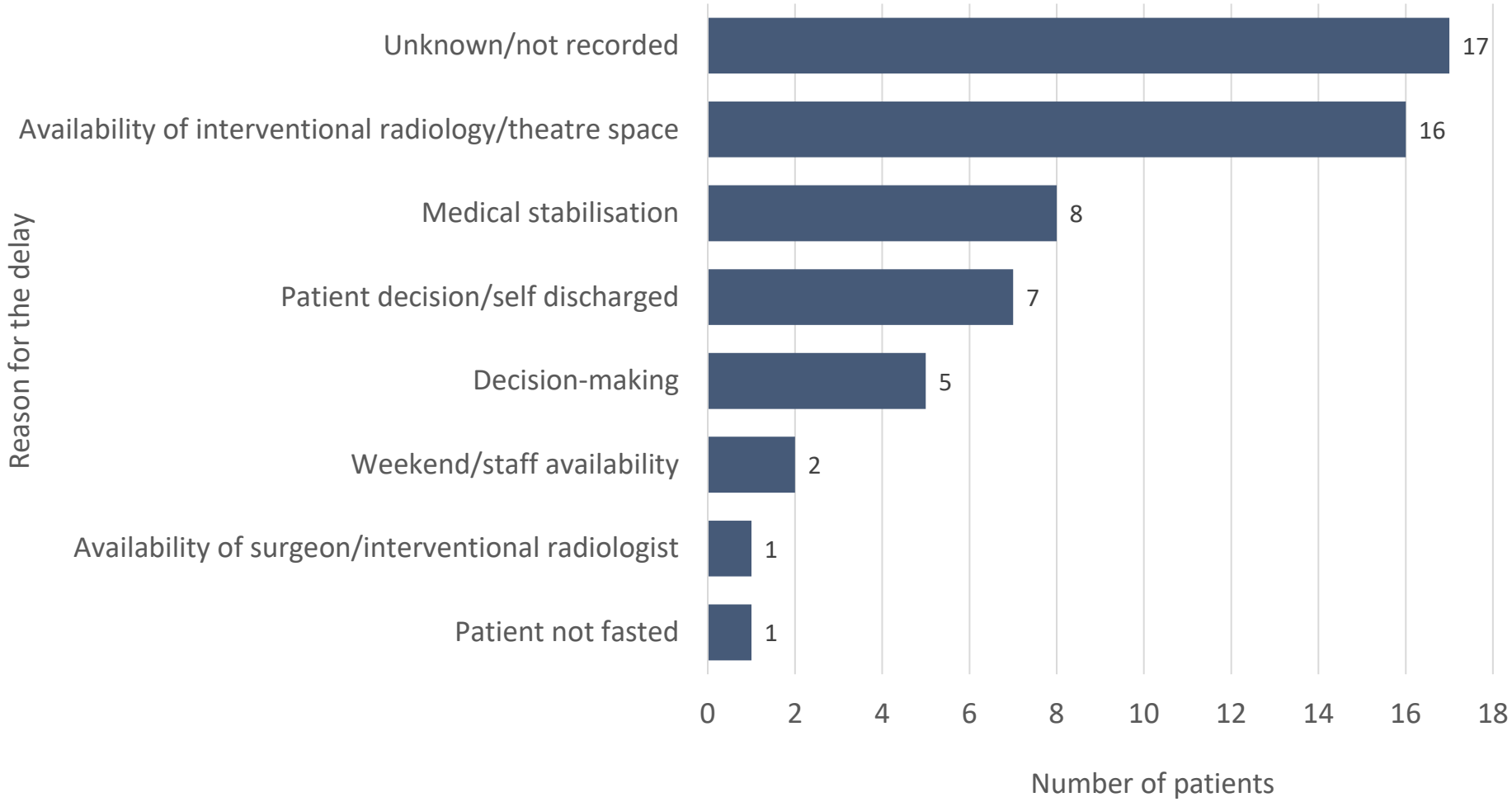

Figure 9.2 Reasons for delays in procedure being performed; *n=50*

Case review data

Table 9.2 An appropriate monitoring/escalation plan for deterioration was documented	Number of patients	%
Yes, a complete plan documenting frequency of monitoring	82	32.9
Yes, but an incomplete plan	53	21.3
Monitoring plan without escalation protocols	45	18.1
Escalation plan but no monitoring plan	10	4.0
No plan documented in notes	57	22.9
Total	**249**	

Case review data

Table 9.3 Overall number of procedures performed	Number of patients	%
1	176	75.5
2	46	19.7
3	8	3.4
4	3	1.3
Total	**233**	

Clinician questionnaire data

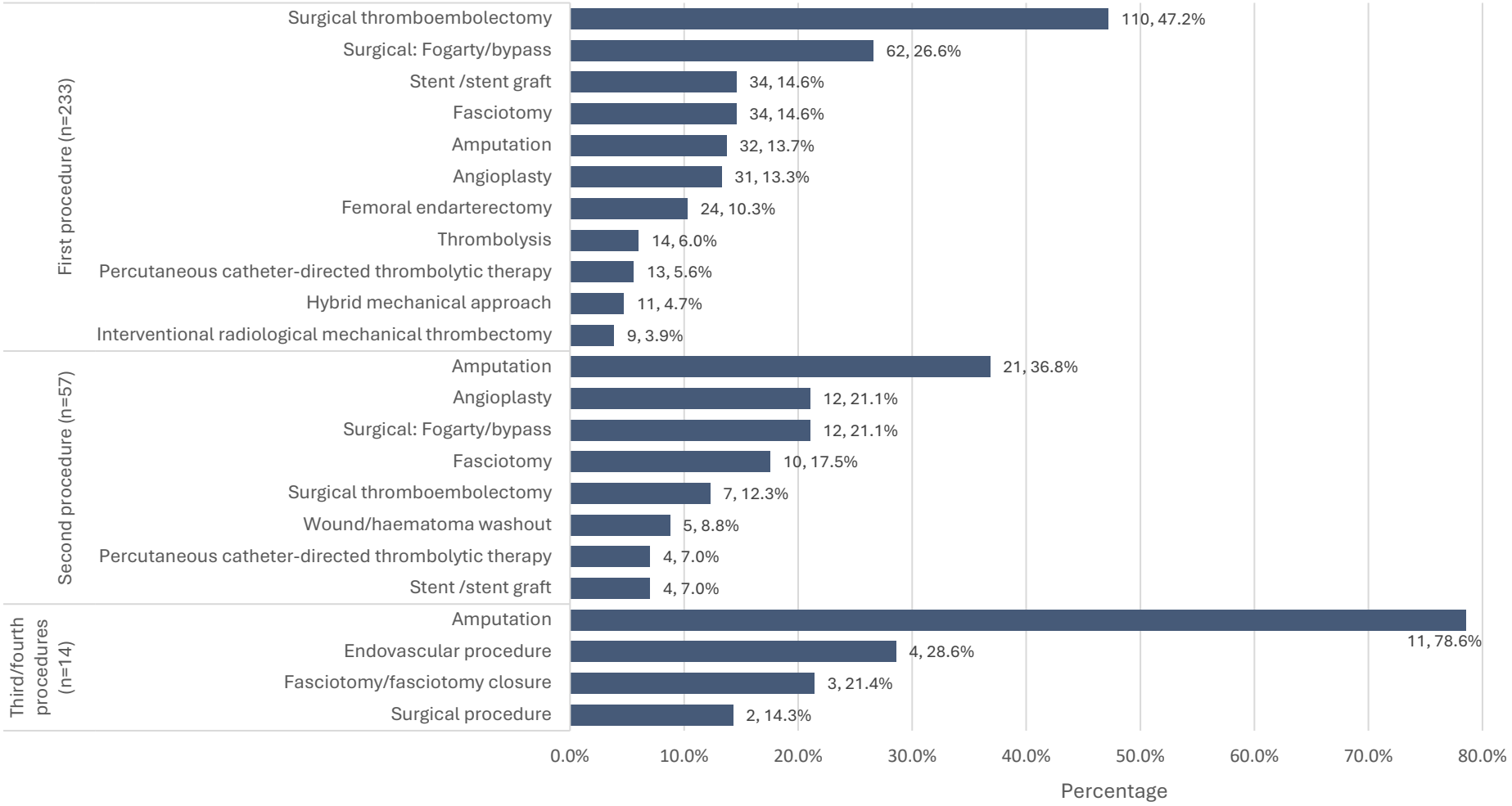

Figure 9.3 Procedures performed

Answers may be multiple; n=230

Clinician questionnaire data

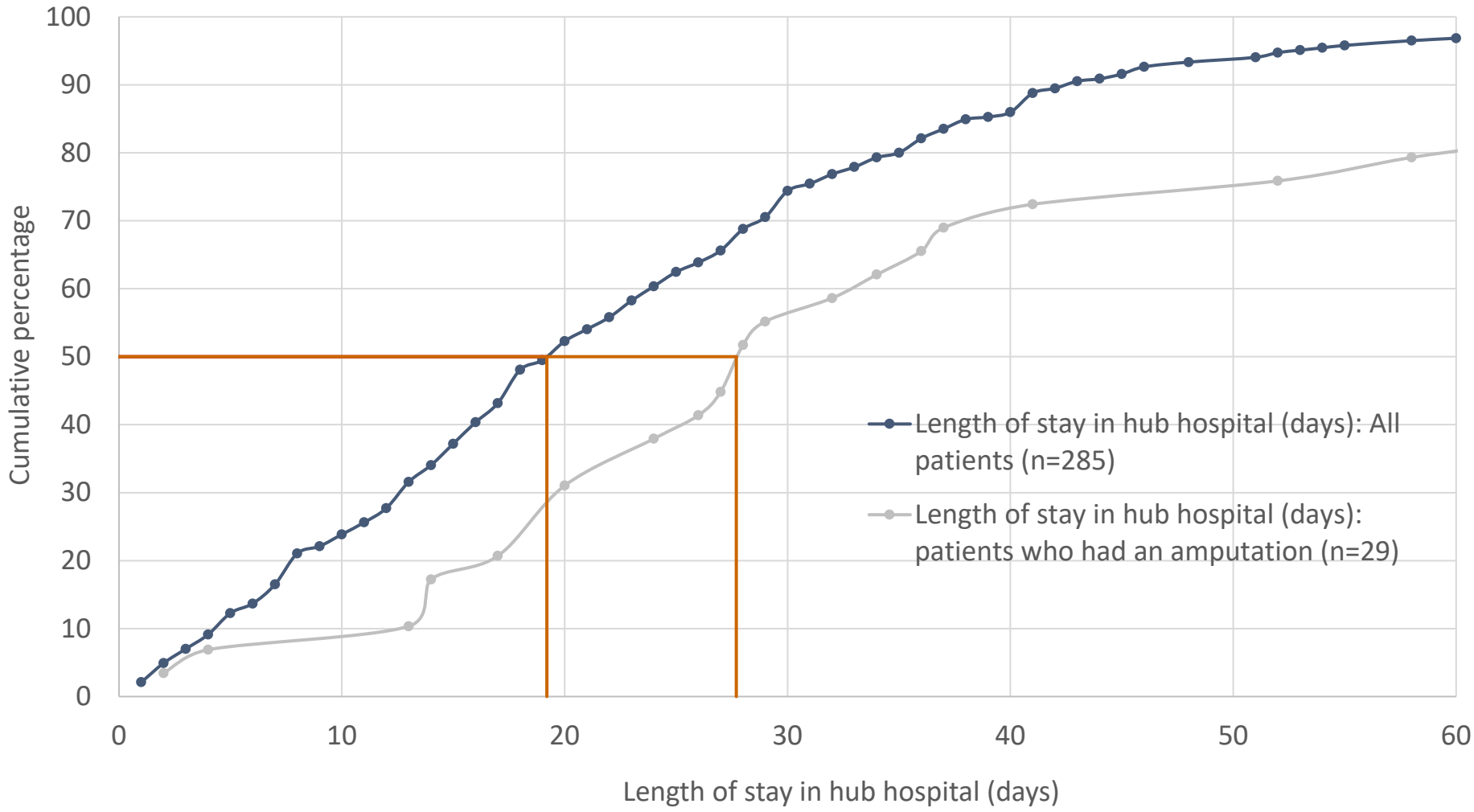

Figure 10.1 Length of stay in hospital for the study population *(n=285)* and for patients who had an amputation; *n=29*

Case review data

Table 10.1 Information missing from the discharge summaries	Number of patients	%
Details of a follow-up appointment with the vascular surgeon	27	61.4
Referrals to community services	26	59.1
Diagnosis	23	52.3
Referral for psychological support	6	13.6
Risk of return of symptoms	5	11.4
Telephone number to call if the patient has problems	4	9.1
Medications prescribed at discharge	4	9.1
Care plan	4	9.1
Details of the procedure/s performed	3	6.8
Wound care advice	2	4.5
Case worker's details	1	2.3

Answers may be multiple; n=44

Case review data

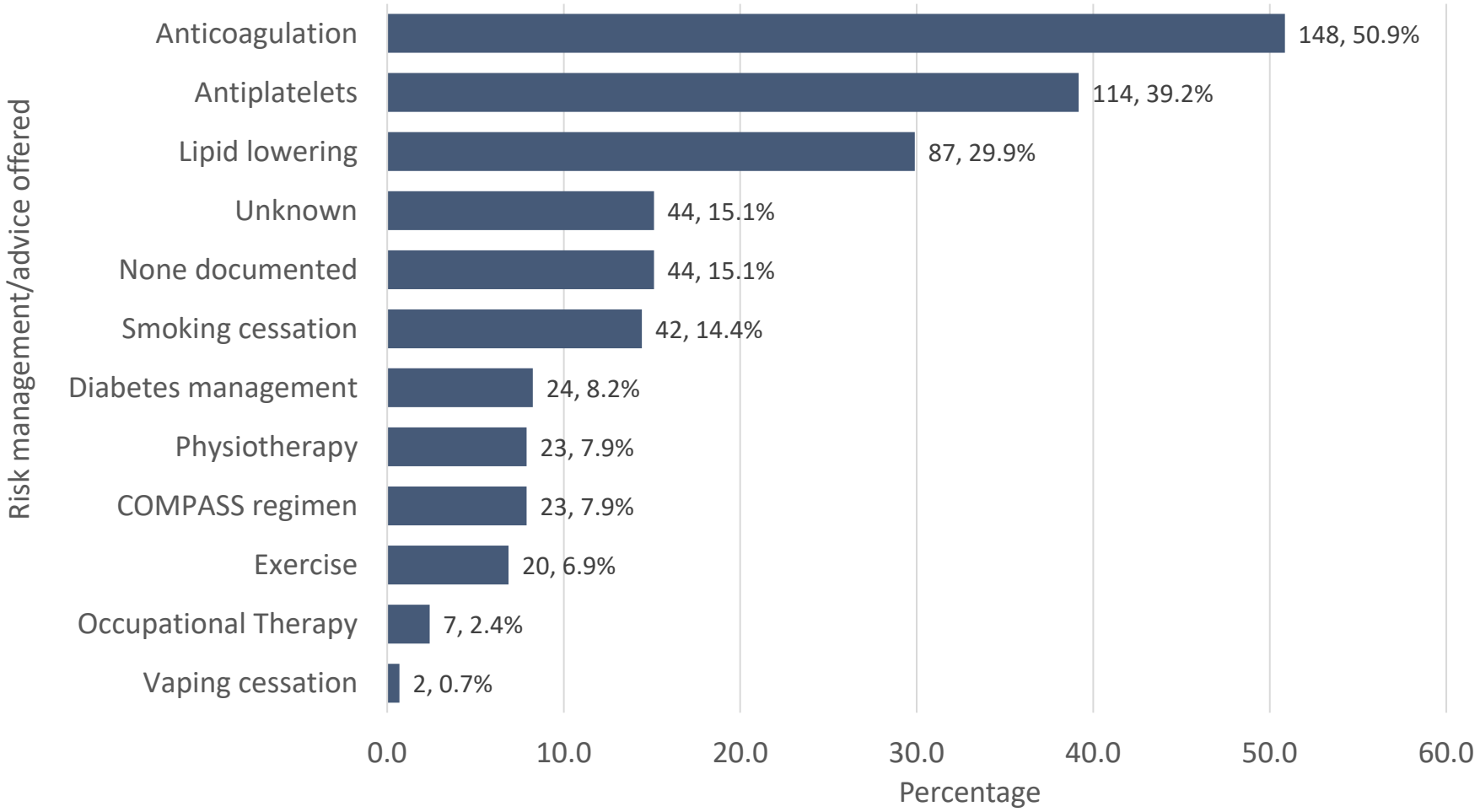

Figure 10.2 Long-term risk management/advice at discharge *Answers may be multiple; n=291*

Case review data

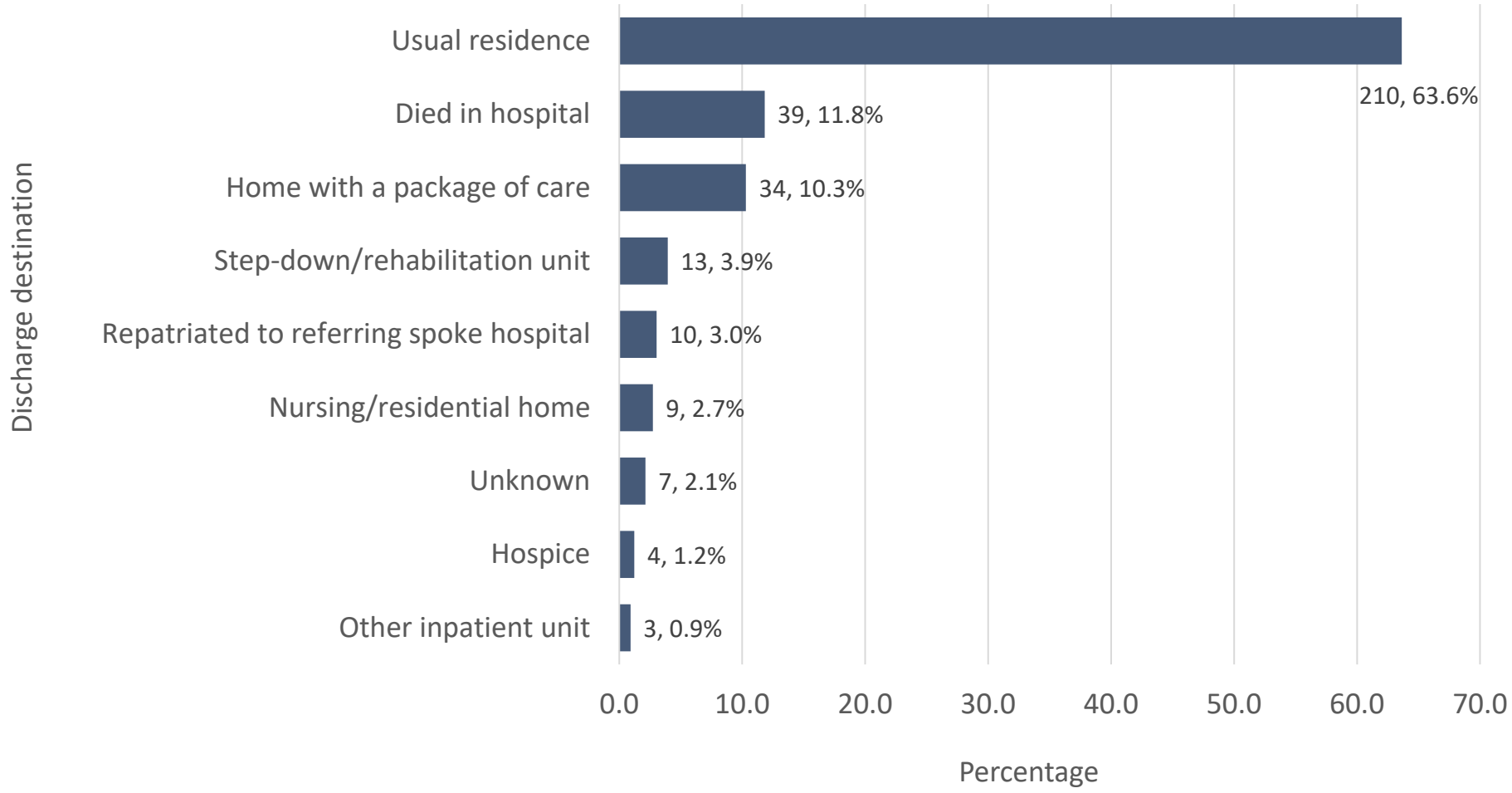

Figure 10.3 Discharge destination of the study population; *n=330*

Case review data

Table 10.2 Change in Rockwood frailty score between admission and discharge	Number of patients	%
No change	141	55.3
Decrease in functionality	68	26.7
The patient died	28	11.0
Increase in functionality	18	7.1
Subtotal	**255**	
Unable to answer	38	
Total	**293**	

Case review data

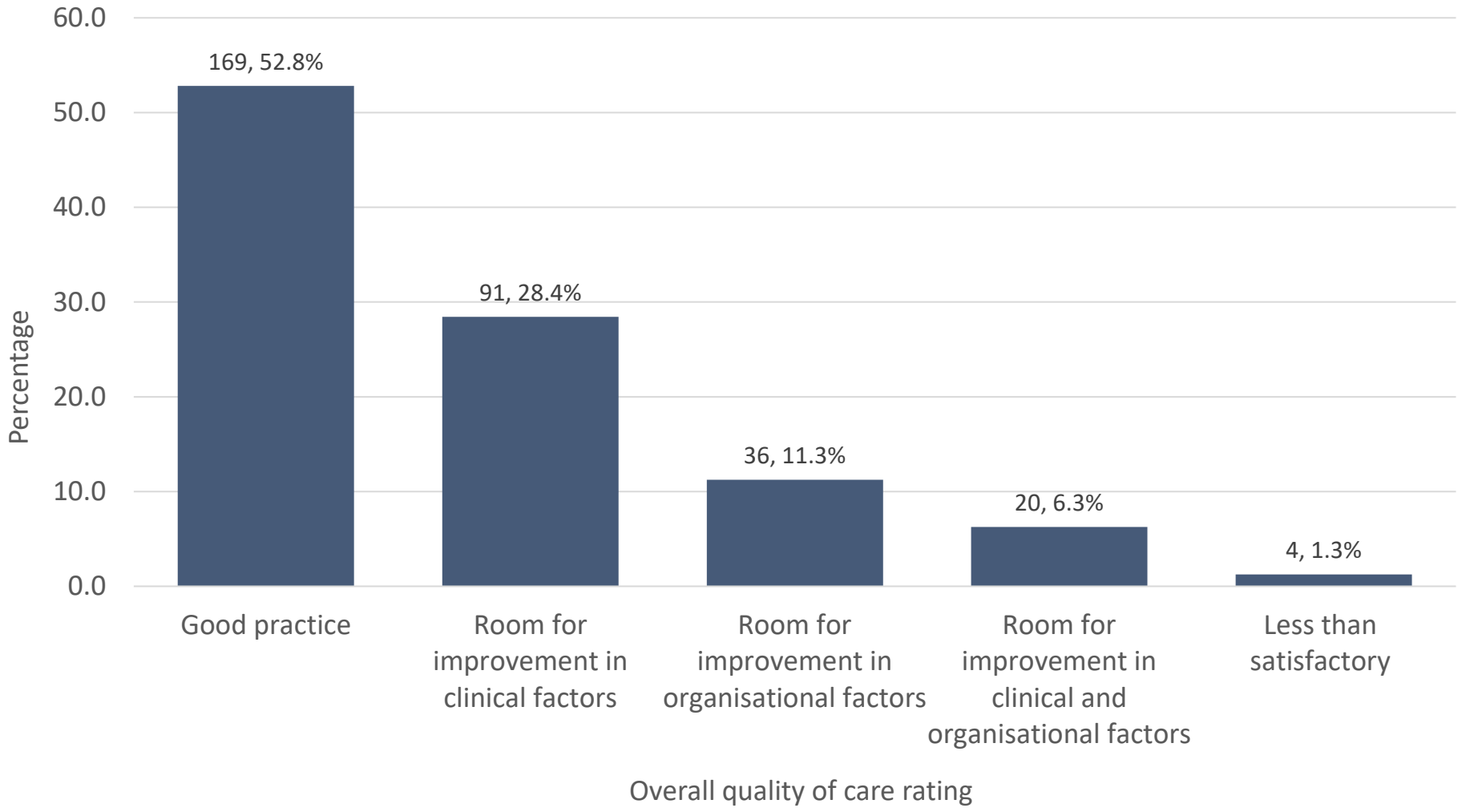

Figure 11.1 Overall quality of care; *n=320*

Case review data